Waterproof Signal Double Lock Connector System

1. Introduction

1.1 Purpose

This is a product validation test. The purpose of this test is to evaluate the performance of (Product Description). Testing was performed on below products to determine its compliance with the requirements of 108-143069.Rev.A2.

1.2 Scope

This report covers the electrical, mechanical, environmental, and material performance for Waterproof Signal Double Lock Connector System. Testing was performed at TE Connectivity Shanghai Electrical Test Laboratory (Building ID 554) between 2023-03-09 and 2023-04-12.
The associated test number is TP-23-00481.

1.3 Conclusion

The items listed in Clause 1.5 conformed to performance requirements of criteria described in Clause 3.
The testing results are only responsible for the specimens tested.

1.4 Test Specimens

Product Description

Waterproof Signal Double Lock Connector System

Specimens received on 2023-03-01 with the following part numbers were used for test:

Test Group	Part No.	Part Rev.	Description	Qty. (pcs)	Part No.	Part Rev.	Description	Qty. (pcs)
1	2443725-2	1	CAP HOUSING FREE HANGING 2PIN	3	2443728-1	1	TAB TERMINAL SDL2.5 WATERPROOF	6
	2443725-6	1	CAP HOUSING FREE HANGING 6PIN	3	2443728-1	1	TAB TERMINAL SDL2.5 WATERPROOF	18
	2443729-2	1	PLUG HOUSING SDL2.5 WATERPROOF 2PIN	3	2321921-1	A	RECEPTACLE TERMINAL	6
	2443729-6	1	PLUG HOUSING SDL2.5 WATERPROOF 6PIN	3	2321921-1	A	RECEPTACLE TERMINAL	18
2	2443725-2	1	CAP HOUSING FREE HANGING 2PIN	3	2443728-1	1	TAB TERMINAL SDL2.5 WATERPROOF	6
	2443725-6	1	CAP HOUSING FREE HANGING 6PIN	2	2443728-1	1	TAB TERMINAL SDL2.5 WATERPROOF	12
3	2443732-2	1	REAR WIRE SEAL 2PIN	8				/
	2443725-2	1	CAP HOUSING FREE HANGING 2PIN	4	2443728-1	1	TAB TERMINAL SDL2.5 WATERPROOF	8
	2443725-6	1	CAP HOUSING FREE HANGING 6PIN	4	2443728-1	1	TAB TERMINAL SDL2.5 WATERPROOF	24
	2443729-2	1	PLUG HOUSING SDL2.5 WATERPROOF 2PIN	4	2321921-1	1	RECEPTACLE TERMINAL	8
	2443729-6	1	PLUG HOUSING SDL2.5 WATERPROOF 6PIN	4	2321921-1	1	RECEPTACLE TERMINAL	24

Test Group	Part No.	Part Rev.	Description	Qty. (pcs)	Part No.	Part Rev.	Description	Qty. (pcs)
3	2443732-6	1	REAR WIRE SEAL 6PIN	8				/
	2208113-2	A	BLIND PLUG 1.2 X 12.9,NANOMQS,GN	20				/
4	2443725-2	1	CAP HOUSING FREE HANGING 2PIN	3	2443728-1	1	TAB TERMINAL SDL2.5 WATERPROOF	6
	2443725-6	1	CAP HOUSING FREE HANGING 6PIN	3	2443728-1	1	TAB TERMINAL SDL2.5 WATERPROOF	18
	2443729-2	1	PLUG HOUSING SDL2.5 WATERPROOF 2PIN	3	2321921-1	A	RECEPTACLE TERMINAL	6
	2443729-6	1	PLUG HOUSING SDL2.5 WATERPROOF 6PIN	3	2321921-1	A	RECEPTACLE TERMINAL	18

1.5 Test Sequence

Test Item	Test Group			
	1	2	3	4
	Test Sequence			
Contact Extraction Force		3		
Contact Insertion Force		2		
Examination of Product	1	1	1	1,6
Humidity and Temperature Cycling				3
Insulation Resistance			2,4	
Low Level Contact Resistance	3			2,5
Mating Force	2			
Temperature Life				4
Unmating Force	4			
Water Proof Test			3	

Note: a). Test group defined per customer requirement.
b). Numbers indicate sequence in which tests are performed.

1.6 Environmental Conditions

Unless otherwise stated, the following environmental conditions prevailed during testing:

Temperature: 15 ℃ to 35 ℃
Relative Humidity: 25 %RH to 75 %RH

2. Summary of Test

Group	SN	Description	Test Item	Qty(pcs)	Test Result				Requirement	Conclusion
					Max	Min	Avg	Unit		
1	1	All samples	Examination of Product	6	No physical damage			/	No physical damage	Meet Spec.
	2	2P	Mating Force	3	8.2	4.9	6.7	N	11.76 N Max.	Meet Spec.
		6P		3	16.7	15.2	15.9	N	35.28 N Max.	Meet Spec.
	3	2P	Low Level Contact Resistance	3	5.99	4.40	4.99	N	20 N Max.	Meet Spec.
		6P		3	5.99	5.08	5.47	N	20 N Max.	Meet Spec.
	4	2P	Unmating Force	3	3.7	2.0	2.7	N	1.18 N Min.	Meet Spec.

Group	SN	Description	Test Item	Qty(pcs)	Test Result				Requirement	Conclusion
					Max	Min	Avg	Unit		
1	4	6P	Unmating Force	3	6.2	5.5	5.7	N	3.54 N Min.	Meet Spec.
2	1	All samples	Examination of Product	0	No physical damage			/	No physical damage	Meet Spec.
	2	2P	Contact Insertion Force	2	4.6	4.0	4.3	N	7.84 N Max.	Meet Spec.
		6P		2	4.8	3.4	4.4	N	7.84 N Max.	Meet Spec.
	3	2P	Contact Extraction Force	2	43.6	41.8	42.5	N	25 N Min.	Meet Spec.
		6P		2	45.0	39.0	42.8	N	25 N Min.	Meet Spec.
3	1	All samples	Examination of Product	0	No physical damage			/	No physical damage	Meet Spec.
	2	2P	Insulation Resistance	3	7.80	3.41	4.92	10^{12} Ω	1000 MΩ (=1*10^{9}Ω) Min.	Meet Spec.
		3P		2	4.01	3.28	3.76	10^{12} Ω	1000 MΩ (=1*10^{9}Ω) Min.	Meet Spec.
		6P		3	16.20	3.28	7.03	10^{12} Ω	1000 MΩ (=1*10^{9}Ω) Min.	Meet Spec.
	3	All samples	Water Proof Test	11	No water ingress			/	No water ingress	Meet Spec.
	4	2P	Insulation Resistance	3	7.37	4.25	5.94	10^{12} Ω	500 MΩ (=5*10^{8}Ω) Min.	Meet Spec.
		3P		2	11.50	4.42	8.83	10^{12} Ω	500 MΩ (=5*10^{8}Ω) Min.	Meet Spec.
		6P		3	11.40	2.63	6.04	10^{12} Ω	500 MΩ (=5*10^{8}Ω) Min.	Meet Spec.
4	1	All samples	Examination of Product	0	No physical damage			/	No physical damage	Meet Spec.
	2	2P	Low Level Contact Resistance	3	6.33	5.88	6.17	mΩ	10 Mω Max.	Meet Spec.
		6P		3	6.63	5.63	6.06	mΩ	10 mΩ Max.	Meet Spec.
	3	All samples	Humidity and Temperature Cycling	6	No physical damage			/	No physical damage	Meet Spec.
	4	All samples	Temperature Life	6	No physical damage			/	No physical damage	Meet Spec.
	5	2P	Low Level Contact Resistance	3	6.74	6.24	6.46	mΩ	20 mΩ Max.	Meet Spec.
		6P		3	7.95	6.04	6.70	mΩ	20 mΩ Max.	Meet Spec.
	6	All samples	Examination of Product	0	No physical damage			/	No physical damage	Meet Spec.

3. Test Procedures and Requirements

2.1 Contact Extraction Force
Apply an axial pull-off load to crimped wire. Operation Speed: 25 mm / min.
Requirement: 25 N Min.
Test Method: EIA-364-29D-2019

2.2 Contact Insertion Force
Measure the force required to insert contacts into housing and remove from housing. Operation Speed: 25 mm / min.
Requirement: 7.84 N Max
Test Method: EIA-364-05C-2020

2.3 Examination of Product
Appearance and function examination according to the applicable inspection spec.
Requirement: No physical damage.
Test Method: EIA-364-18B-2007

2.4 Humidity and Temperature Cycling
Subject mated specimens to 10 cycles (1cycle=24hours) of humidity-temperature cycling. Each cycle consists of temperature between 25 ℃ and 65 ℃ and humidity between 80 %RH 100 %RH.
Requirement: No physical damage.
Test Method: EIA-364-31F-2019

2.5 Insulation Resistance
Measured with a test voltage of 500 V dc for 2 minute(s) between adjacent contacts.
Requirement: Initial: 1000 MΩ Min; Final: 500 MΩ Min
Test Method: EIA-364-21F-2020

2.7 Low Level Contact Resistance
Subject contacts assembled in a housing to20mV (max.) open circuit at 10 mA. Measure between contact and at wire 75mm from end of contact.
Requirement: Initial: 10 mΩ Max.; Final: 20 mΩ Max.
Test Method: EIA 364-23C-2006 (R2017)

2.8 Mating Force
Measure axial force necessary to mate specimens at operation speed: 25.4 mm/min
Requirement: 5.88 N /Positions Max
Test Method: ECIA EIA-364-13E-2011

2.9 Temperature Life
Subjected mated specimens to a temperature of 105° C for 96 hours.
Requirement: No physical damage.
Test Method: EIA-364-17C-2011

2.10 Unmating Force
Measure force necessary to unmate samples at maximum rate of 25.4 mm/min.
Requirements: 0.59 N/Positions Min.
Test Method: EIA-364-13E-2011

2.11 Water Proof Test (IPX7)
Immerse specimens into a water tank with the depth of 1 m for 30 minutes.
Requirement: No water ingress is found after test.
Test Method: IEC 60529-2013

4. Validation

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